

Testing Requirements for a Combined License

November 30, 2001

Purpose

- Discuss regulatory requirements on testing
- Demonstrate that full-scale prototype testing is not required for a combined construction permit and operating license (COL)
- Describe plans to determine whether additional testing is needed to support licensing of the Pebble Bed Modular Reactor (PBMR)

Summary of Test Requirements

Type of Test	Prerequisite to COL Issuance	Applicable to PBMR
QA Tests App. B, Criteria II & X; GDC 1; § 50.55a(a)(1)	No	Yes
Qualification & Proof Tests § 50.49(f); App. B, Criteria III & XI; App. S; Part 100, App. A	No	Yes
Pre-op Tests § 50.34(b)(6)(iii); App. B, Criterion XI	No	Yes

Summary of Test Requirements

Type of Test	Prerequisite to COL Issuance	Applicable to PBMR
Tests of specific SSCs GDC 14 & 30; Appendices G and J	No	Yes
ITAAC § 52.47(a)(1)(vi) and § 52.79(c)	No	Yes

Summary of Test Requirements

Type of Test	Prerequisite to COL Issuance	Applicable to PBMR
Startup Tests § 50.34(b)(6)(iii); App. B, Criterion XI.	No	Yes
IST & Surveillance §§ 50.36(c)(3) and 50.55a(f), various GDC, and other regulations	No	Yes
Full-Scale Prototype Test § 52.47(b)(2)	No	No

Full-Scale Prototype Testing

- Exelon's comments on draft Part 52 explain the basis for concluding that there are no prototype test requirements for licensing
- Part 52 Statement of Consideration
 - Only “mature” designs may be certified
 - Maturity demonstrated by prototype testing
 - “Prototype testing is only required for design certification”
 - Prototype plants may be licensed using a COL

Full-Scale Prototype Testing

- There are alternatives to prototype testing to support licensing of a first-of-a-kind reactor, such as special design provisions and license conditions
- Requiring prototype testing to support issuance of a COL would create a *Catch-22* and an untenable situation

Existing PBMR Experience and Testing

- Extensive experience and test data exist that can be applied to support licensing of the PBMR, including:
 - U.S. HTGRs (Peach Bottom 1; Ft. St. Vrain)
 - AVR (15 MWe; 20 Years)
 - THTR (300 MWe; 3 Years)
 - HTR-10 in China
 - Tests on AVR fuel
 - Pebble flow experiments

Existing PBMR Experience and Testing

- Existing data covers fuel performance, pebble flow, and passive heat transfer
- COL application will use this data
- Exelon will develop a process to determine whether more testing is needed to support licensing
- Currently, testing of the RSA demonstration unit does not appear to be needed to support licensing of the PBMR in the U.S.